ATOMIC ENERGY newsletter®

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH

ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N. Y.

December 14th, 1954
Vol. 12...No. 9

Dear Sir:

A prediction that atomic energy will be the heat source for one-half of all new electric power facilities being installed in 1976 was made by Ralph J. Cordiner, president, General Electric Co., before the National Association of Manufacturers, meeting last fortnight in New York. This will not upset requirements for coal, gas, and oil, he observed, noting that these fossile fuels would be used in ever-increasing quantities.

Vitro Corp. of America (New York) is now supplying thru its engineering division nuclear engineering services for Consolidated Edison Co. of New York, according to H.R. Searing, president of the utility firm. Consolidated Edison is now in the exploratory discussion phase with certain manufacturers who are interested in building an electric generating station, using nuclear fuel as the heat source, for that firm. Mr. Searing explained that in studying and evaluating the manufacturers' proposals from the economic and technical point of view, the experience of nuclear engineers was needed. (Vitro's engineering division is the former Kellex Corp., formed in 1942, which worked on the original gaseous diffusion plant at Oak Ridge.) (Other BUSINESS news, page 2 this LETTER.)

A firm to manufacture heavy water for France's nuclear reactors has been established in that country. To be known as the Compagnie Francaise de l'Eau Lourde, the company was sponsored by the Office National Industriel de l'Azote (O.N.I.A.) and the Societe l'Air Liquide; financial support was given by the Government. Initial work will be erection of a pilot plant at Toulouse in the works of O.N.I.A. All heavy water now being used by France is supplied by the only firm in Europe which sells it: the Norwegian Nitrogen Co. (Other INTERNATIONAL news, page 3 this LETTER.)

A United States patent has now been granted for an atomic bomb air zero locator (2,696,050 dated Dec. 7, 1954), and assigned to The USAEC. Purpose of the device is to act as an atomic bomb burst direction indicator..... Titled Radio Electric Generator, a United States patent (2,696,564 dated Dec. 7, 1954) has now been issued and assigned to the USAEC. Inventor was Philip E. Ohmart, who left Mound Laboratory, and on the basis of research such as that revealed by this patent, formed the Ohmart Corp. (Other PATENT news, page 5 this LETTER.)

The Society of Nuclear Medicine is now planning to meet June, 1955, in Portland, Ore. The meeting will consist of symposia, in which leaders in the field of nucleonic therapeutics will describe new developments. The Society, which was formed May, 1954, now has as members 137 physicians and scientists from 24 states. Headquarters are in Seattle, Wash.

Vanadium Corp. of America will now increase the milling capacity of its uranium processing plant at Naturita, Colo., under an amended USAEC contract recently signed by the firm with the USAEC. This is the seventh uranium plant expansion in the Colorado Plateau area announced by the USAEC in less than eight months.

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ATOMIC ENERGY BUSINESS REPORTS...a current news round-up...

New Firm in Nuclear Field:- A new organization, known as Radiation Applications, Inc., (New York), has now been formed to offer consulting services in the field of ionizing radiation. Members of the firm, some of whom have pioneered in irradiation research, include: J.S. Butts, head, Dep't of Agricultural Chemistry, Oregon State College; E.J. Henley, Dep't of Chemical Engineering, Columbia Univ.; V.L. Parsegian, chairman, Engineering Group, Rensselaer Polytechnical Institute; E. Sargent, chemical engineer; E.L. Gaden, Jr., Dep't of Chemical Engineering, Columbia University; B. Manowitz, engineer in charge, Fission Products Utilization project, Brookhaven National Laboratory; and W.R. Singleton, senior geneticist, Brookhaven National Laboratory. The experience of these individuals, which this firm now offers on a consulting basis, has been in the fields of foods, drugs, chemicals, including plastics and self-luminous paints, and measurement techniques.

Nuclear Materials Committee Formed:- An industrial nuclear reactor materials committee, now formed within the membership of the Atomic Industrial Forum, Inc. (New York) will survey the adequacy of materials research in the nuclear power field; promote publication and dissemination of existing and new data; and initiate and sponsor research and development where no work has been previously done. Company members of the Forum, who comprise this committee, include: Allegheny Ludlum Steel Corp.; Aluminum Co. of America; The Babcock & Wilcox Co.; Climax Molybdenum Co.; International Nickel Co.; Lukens Steel Co.; Nuclear Metals, Inc.; Republic Steel Corp.; Titanium Metals Corp.; and Vanadium Corp. of America.

NOTES:- A financial analysis of American Locomotive Co., prepared by Newburger, Loeb & Co. (15 Broad St., New York 5) observes that in addition to other operations, American Locomotive did some $22 million worth of business with the USAEC in 1953, and should show the same volume in 1954..... William O. Faxon has now been elected a director and executive vice president of Tracerlab, Inc., Boston nuclear products firm..... Tibor F. Nagey will now head the recently established nuclear energy division of Glenn. L. Martin Aircraft Co. (Baltimore). The division will develop nuclear reactors and associated equipment for military and industrial purposes..... O. Pomeroy Robinson, Jr., senior vice president and board member of General Dynamics Corp., has now assumed new duties in the corporation's atomic energy work and in its international operations.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...from the manufacturers...

New Instruments:- A new fast-slow coincidence circuit, said to be an improvement over earlier Oak Ridge National Laboratories models, is now in production by this manufacturer. This DZ4 coincidence circuit is said to permit the use of single and multi-channel analyzers having considerable time uncertainty. Fast channel resolving time range is stated as from 0.01 microseconds to several micro-seconds.--Detectolab, Inc., Chicago 26, Ill.

Model ISA Isotope Analyzer is a new instrument designed to perform rapid and accurate qualitative and quantitative analyses of isotope mixtures containing beta emitting components. Said to be several times as sensitive as beta spectroscopes, the analyzer is recommended for medical examinations using multiple tracer technics, in neutron activation analyses, and for the determination of the nature of food contamination. --Forro Scientific Co., Evanston, Ill.

New Products:- Polyethylene, subjected to ionizing radiation, with superior characteristics for certain applications, and trade-named Agilene-HT, is now offered in sheet, rod, pipe, tubing, and other forms by American Agile Corp. (Maple Heights, Ohio)..... An irradiated polyethylene tape is now being used by General Electric Co. (Phila.) for turn insulation in circuit breakers. The tape, produced by another G-E division, and trade-named Irrathene-201, is said to possess high dielectric strength as well as requisite thermal and mechanical properties.

Notes:- A radiation-balance microcalorimeter, recently developed by W.B. Mann, National Bureau of Standards (Washington, D.C.) is said to precisely determine the emission rate of low-activity radioactive sources. This is accomplished by measuring the minute amounts of heat energy which accompany radioactive emission. The device is compact, and requires a relatively short time for a determination.

NEW BOOKS & OTHER PUBLICATIONS...on atomic energy subjects...

Radioisotopes in Biology and Agriculture: Principles and Practice, by C.L. Comar, Univ. of Tennessee-USAEC research program. Procedures and methods for radioisotope tracer studies; facilities required; and other necessary biological and chemical information for such work. --McGraw-Hill Book Co., New York 36.

The Bomb, Survival, and You, by F. N. Severud (senior partner, Severud-Elstad-Krueger, consulting engineer firm), and A.F. Merrill, professional journalist. Materials for, and methods of, designing structures to withstand loads which may be imposed by nuclear explosions. --Reinhold Publishing Corp., New York 17. ($5.95). (Note: A technical supplement to this book, containing mathematical analyses of blast loadings, as prepared by Dr. Kurt Bernhard, is available at $2.50 from this firm.)

Investment Problems and Opportunities in Atomic Energy, by A.G. Erpf, senior partner, Carl M. Loeb, Rhodes & Co. An address made at a recent New York meeting of Atomic Industrial Forum, Inc. Available on request from this firm at 42 Wall St., New York 5.

The Effects of Atomic Bomb Blasts on Elevated Tanks and Standpipes: an analysis by the USAEC. Of interest to the petroleum refining and chemical industries, since the tanks and standpipes discussed are of the type normally used in operations in those fields. --Office of Technical Services, Wash. 25, D.C. (70¢).

Sequence of Principal Events in Connection with Power Supply for Paducah to Replace Power Now Being Furnished by TVA. A chronological account, by the USAEC, of the so-called Dixon-Yates power contract. --USAEC, 1901 Constitution Ave., Wash. 25, D.C.

The Effect of X-irradiation on the Action of Analgesic Drugs, by J.C. Ballin, and J.L. Wilding, U.S. Air Force, School of Aviation Medicine, Randolph Field, Tex. One of a series of studies on the biological and medical aspects of ionizing radiation. --Available as No. PB-115262 from: Office of Technical Services, Wash. 25, D.C. (Microfilm: $1.50; Photocopy $1.50).

NOTES: Bibliographies, containing readily available references on the use of radioisotopes as tools in the physical sciences, medical sciences, industrial applications, etc., and now available on request from Isotopes Div., Oak Ridge National Laboratory, Oak Ridge, Tenn., include: (1) References on the Uses of Radioisotopes in Humans; covers diagnostic materials, therapeutic materials, clinical research, human physiology, and general research. (2) References on the Uses of Radioactive Phosphorous in the Biological Sciences. (3) The Application of Radioisotopes in the Metals Industry.

Nuclear Notes For Industry (Dec. 3rd, 1954 issue), a guide to USAEC-developed non-secret information of special industrial interest, may be obtained on request to: Technical Information Serv., USAEC, Oak Ridge, Tenn.

INTERNATIONAL ATOMIC ENERGY NEWS...

GERMANY:- A group has now been formed by four major West German industrial concerns, and twelve others, to build a nuclear reactor for industrial power producing purposes. The four concerns heading the project are Degussa, Bayer, Hoechst, and Siemens. A budget equivalent to $5 million has been considered by the group for the reactor and associated housing and equipment.

BELGIUM:- A nuclear energy planning syndicate has now been formed in Brussels. The chief organizers and stockholders in the syndicate include a number of chemical manufacturers, and electrical and metallurgical companies, in association with the Union Miniere du Haut-Katanga (suppliers of uranium minerals), and the Societe Generale de Belgique.

UNITED NATIONS, N.Y.:- Last fortnight the UN General Assembly unanimously adopted a resolution stemming from President Eisenhower's atoms-for-peace program. The resolution puts the program in concrete form by directing the UN Secretary General to convene an international technical conference by August, 1955, to study atomic power and other areas such as biology, medicine, radiation protection, and fundamental science.

ATOMIC ENERGY & INDUSTRIAL APPLICATIONS: A special condensation of remarks by Lewis L. Strauss, Chairman, USAEC, before Executives' Club of Chicago, Chicago, Ill., December 3rd, 1954.

In the past 12 years, some $14 billion of public funds have been spent on the atomic energy project in the U.S., during war and peace. For it, the U.S. has vast plants, great discoveries, and vital stockpiles of weapons and fissionable material. While weapons production has indeed been the first and paramount concern of the USAEC, the production of bombs is not all that we have to show for this gigantic expenditure of money and effort. I would like to give you a quick preview of some of the items (besides bombs) on the credit side of the ledger, in fields other than medicine.

In agricultural work, experiments with ionizing radiation, to produce beneficial mutation in plants, have been carried on successfully in the laboratories of the USAEC at Brookhaven National Laboratory (Upton, N.Y.) and elsewhere. There has been notable success in the development of oats which are resistant to the disease known as rust. Other researchers are working on other cereal and leguminous crops. It has also been found that a properly localized dosage of radiation can produce at least one generation of wilt-resistant tomato seedlings.

Some of you already know that prepackaged meat products, if exposed to mild gamma-ray pasteurization, can remain in the grocer's stock for nearly 21 days, instead of 3 days. Studies show that a complete facility to do this could be built for considerably less than $750,000. If financed with 6% money, a charge of a small fraction of a cent per pound of the irradiated product would amortize it in 5 years.

The next item on the credit side of the ledger is the Atoms for Peace plan of President Eisenhower made to the United Nations a year ago.

Making this plan concrete, we offered about two weeks ago to earmark 100 kilograms of fissionable material for use by other countries. What can be done with 100 kilograms of such material? (The fissionable material we will provide will not be weapons grade; it will be in a form particularly suitable for peaceful applications.)

One example of such use would be as fuel for research reactors.

Let me digress to discuss research reactors. You might be interested to know that the USAEC has now removed the security restrictions as to access which have surrounded the CP-5 Argonne National Laboratory (Chicago) research reactor. The CP-5 (Chicago Pile No. 5) has now been in the main declassified and information on its construction and operation will be available.

Returning to the 100 kilograms of fissionable material, other countries could use allocations from such an amount in research reactors like the CP-5. (The CP-5 is fueled with aluminum clad enriched uranium, and cooled and moderated with heavy water. This combination permits a high neutron flux, an important feature of a research reactor. Fortunately, this high flux is obtained at a modest rate of fuel consumption. Even with such economy, the CP-5 is surpassed only by the Materials Testing Reactor, at Arco, Idaho, National Reactor Testing Station. We believe that it exceeds, in effectiveness, any research reactor overseas.)

Our people believe that 100-kilograms of uranium-235 is sufficient to provide the critical inventory for 15 such reactors; to keep them in operation approximately 5-years; and still to have almost two-thirds of the fuel inventory unconsumed. Each reactor could produce more radioisotopes of varied types than are presently needed by any country in the world.

The most remarkable point is that just one of these reactors will put a country into business in such fields as: production of radioisotopes; medical therapy, both by direct use of external beams, and by producing sources for use elsewhere; training centers for the education of scientists and the advancement of nuclear technology; radiation physics measurements; and other applications.

Total cost for such a reactor (exclusive of fuel and moderator), including the reactor, the reactor building, and the associated laboratories, is about $2½ million. This cost might be considerably less in countries where construction costs are lower than in the U.S. And other types of research reactors may indeed be built for sums measured in hundreds of thousands, rather than millions of dollars.

ATOMIC PATENT DIGEST...latest U. S. grants made...

PRIVATE ORGANIZATIONS:- Method and apparatus for measuring ionizing radiations. Apparatus for measuring the apparent charge of an electret, comprising an electret holder adapted to contact one face of the electret, a movable plate adapted to contact the opposite face of the electret or to be positioned a predetermined distance from such face, selectively, and an electron discharge tube having a cathode, a grid, and an anode, with the anode being connected to the movable plate and an ammeter connected between the grid and the cathode, with means to apply positive potential to the grid. U. S. Pat. No. 2,695,363 issued Nov. 23rd, 1954; assigned to General Electric Co., New York. (Inventor: Harry B. Marvin.)

GOVERNMENT ORGANIZATIONS:- Pulse analyzer for determining pulse height distribution. Comprises (in part) a pair of chennels fed from a common source of pulses, a pulse height discriminator positioned in each channel (the discriminator of one of the channels operating at a higher threshold potential than the discriminator of the other of the channels) means for storing the pulses passing through the first channel, and means for delaying the pulses passing through the other channel. Clamp means responsive to signals from the other channel remove the stored pulses from the storing means. An anti-coincidence circuit combines the pulses from the channels in opposition. U.S. Pat. No. 2,694,146 issued Nov. 9, 1954; assigned to United States of America (USAEC). (Inventor: Edward Fairstein.)

Recovery of zirconium tetrachloride from its complex compounds. The method of recovering zirconium tetrachloride from zirconium tetrachloride-phosphorous pentachloride which comprises (in part) mixing the compound with a reducing agent selected from the group consisting of magnesium and phosphorous, with the reducing agent being present in the reaction mixture in an amount not substantially greater than that required to convert the phosphorous pentachloride to the trichloride, heating the reaction mixture to 100-225 deg. C. to vaporize the phosphorous trichloride from it, and thereafter heating the reaction mixture to 275-350 deg. C. to vaporize the zirconium tetrachloride, and subsequently to condense the vaporized zirconium tetrachloride. U. S. Pat. No. 2,695,213 issued Nov. 23rd, 1954; assigned to United States of America (USAEC). (Inventor: Willis C. Fernelius.)

Method of making metallic oxyfluorides. Comprises (in part) reacting tungsten trioxide with fluorine and recovering the oxyfluoride. U. S. Pat. No. 2,695,214 issued Nov. 23rd, 1954; assigned to United States of America (USAEC). (Inventors: Donnelle W. Sherwood and Gregory C. Banikiotes.)

Process for the concentration of isotopes. In a process for concentrating deuterium oxide in a caustic electrolyte by electrolytic fractionation in successive stages of progressively higher deuterium content in which the major portion is of the electrolyte in each stage electrolytically decomposed to a gaseous mixture of hydrogen, deuterium, and oxygen, the improvement which comprises drying the gaseous mixture generated during electrolysis in each stage by contacting the gaseous mixture with solid caustic drying agent to form an aqueous solution of the drying agent. The solution is added to a stage wherein the electrolyte contains a concentration of deuterium oxide approximately equivalent to that of the solution. U. S. Pat. No. 2,695,268 issued Nov. 23, 1954; assigned to United States of America (USAEC). (Inventor: Charles Alfred Wright.)

Pyrometer. Two Geiger-Muller type radiation detectors are used in combination; the cathode of each is characterized by a different work function. Means are provided for exposing the cathodes to the radiations emitted by the body, the temperature of which is to be determined. Means are further provided for deriving first and second voltages proportional to the rate of occurrence of Geiger discharges within these detectors, as well as means for deriving a third voltage proportional to the ratio of the first and second voltages, this third voltage being proportional to the temperature. U. S. Pat. No. 2,695,364 issued Nov. 23rd, 1954; assigned to United States of America (USAEC). (Inventor: Ralph A. Wolfe.)

Sincerely,

The Staff,
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